

Bivariate Cox Models and Copulas

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This talk presents model for bivariate lifetime. It is defined through a marginal Cox model on one of the variables and a conditional Cox model on the second. This model allows a clear description of the impact of the covariate on the dependence structure of the variables through their copula. The covariate acts in a simple way on the copula when the bivariate baseline hazard belongs to quite general classes of distributions, typically when it is PQD. Inside this class, the class of bivariate distributions with extreme value copulas or with an Archimedean copula is stable under the effect of the covariate, which means that the role of the covariate results in a simple and explicit way on the resulting copula. Parametric classes connected with the Gumbel copula play an important role in this respect.