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Extreme dependence of multivariate catastrophic losses.

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This paper deals with modelling of the dependence in insurance loss severities caused by natural catastrophes in several different lines of business. The authors introduce a common factor for modelling extreme dependence. The basic idea of the factor approach is to use a single intensity variable to describe aggregate amounts of losses across different lines of business. Let us denote by $X_{i,j}$ the amount of losses of the j-th line of business for the i-th natural disaster. It is considered the following model $X_{i,j} = T_j(Y_i\eta_{i,j}),\ j = 1, 2$, where Y_i is the intensity of the i-th natural disaster and is a common latent factor, the $\eta_{i,j}$ are so-called multiplicative disturbances which are independent of Y_i, and the T_j are transformation functions. The authors consider the models with multivariate distributions where the marginals are Pareto-type. Bivariate extreme value theory is presented and it is derived from the factor model a class bivariate extreme value distributions which takes into account the dependence structure of catastrophic losses. Several examples are presented. The authors discuss two common approaches of estimating bivariate extreme value distribution and introduce an estimator adapted to proposed factor model. It is studies the finite sample behaviour of the estimator on simulated data and it is compared its performance with those of standard estimators. The application to storm insurance data is presented. *A. D. Borisenko (Kyïv)*

Classification: K80 K90
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