

On Copulas and Order Statistics

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In many applications of probability theory one has to deal with the system of identically distributed but dependent random variables. The well known examples are the coherent systems in the reliability theory, the pension plans for "cohorts" of people in the same age, considered in the theory of insurance or the pricing of the synthetic CDOs (collateralized debt obligations). Very often arises a question of a possibility to apply a model based on an absolutely continuous joint distribution function. Such problem can be decomposed into two ones such that each of them may be treated independently: whether the marginal one-dimensional distribution functions are absolutely continuous and whether a copula describing the interdependencies is absolutely continuous. We deal with the second "subproblem". We formulate the necessary and sufficient conditions for a sequence of distribution functions to be a family of distribution functions of order statistics corresponding to an absolutely continuous copula.