

INTERMEDIATE CLASSES BETWEEN QUASI-COPULAS AND COPULAS IN HIGHER DIMENSIONS

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The notion of an n -quasi-copula was originally used to characterize operations on distribution functions that can or cannot be derived from operations on random variables, but was later characterized in terms of simpler analytical properties. Using the latter characterization, it has been shown that quasi-copulas play a vital role in the problem setting of finding the best possible bounds on a given subset of copulas of interest.

In this talk, we recall some basic properties of n -quasi-copulas, their relationship with n -copulas and highlight some properties of 2-copulas that cannot be extended to higher dimensions. Then, we observe that as the dimensionality increases there are more intermediate classes between the class of n -quasi-copulas and the class of n -copulas.

One such class consists of supermodular n -quasi-copulas, which coincides with the class of copulas for $n = 2$. We show that supermodular n -quasi-copulas have properties that are similar to those of 2-copulas that do not hold for higher-dimensional copulas.

Finally, we use the newly introduced classes to generalize a volume-based characterization of bivariate quasi-copulas to higher dimensions.

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