Abstract

An Approach to Fitting Copulas to Empirical Data and Distortion of the Gaussian Copula.

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Copulas are now a major tool in modelling the correlation structure of risks in insurance and finance as well as in other applications. There are several ways for constructing copulas. Genest (Barcelona 2000) introduced a simple transformation of copulas to generate new families of copulas - we refer to such transformations as distortions. The wide class of Archimedean copulas are distortions of the product (or independence) copula. We are interested in distortions of Gaussian copulas and matching these distortions to data. From empirical data we construct a Bernstein empirical copula, and then solve a diagonal equation to determine a distortion of a Gaussian copula to match this to the Bernstein Copula. The methodology is practical to implement and has applications to enterprise risk management, CDO modelling and pricing financial contracts with multiple risk factors.