Which Archimedean Copula is the right one?

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Abstract

This paper presents the concept of the copula from a practical standpoint. Given the widened use of the multinormal distribution, we argue its inadequacy, while advocate using the copula as an alternative and better approach, for instance with regard to credit derivatives valuation and pricing. We examine what the copulas are used for within areas of risk management. Then we expose a guide to choose both the margins and the Archimedean copula that provide a better fit to real-world data. In addition, we provide an algorithm to simulate a random bivariate distribution from an Archimedean copula. In order to cover the gap between the theory and its practical implementation, we provide the VBA codes required. We also illustrate the use of copulas in the pricing of a first-to-default credit derivative contract. They are used in a numerical example that illustrates the use of the copula in the pricing of a first-to-default contract. Two spreadsheets accompany the paper, and present a step-by-step description of the practical application of the copula.

Keywords: Copula, Kendall Tau, Dependence, and Credit Derivatives