Simulating from the copula that generates the maximal probability for a joint default under given (inhomogeneous) marginals

Starting from two default times with given univariate distribution functions, the copula which maximizes the probability of a joint default can be computed in closed form. This result can be retrieved from Markov-chain theory, where it is known under the terminology "maximal coupling", but typically formulated without copulas. For inhomogeneous marginals the solution is not represented by the comonotonicity copula, opposed to a common modeling (mal-)practice in the financial industry. Moreover, a stochastic model that respects the marginal laws and attains the upper-bound copula for joint defaults can be inferred from the maximal-coupling construction. We formulate and illustrate this result in the context of copula theory and motivate its importance for portfolio-credit risk modeling. Moreover, we present a sampling strategy for the "maximal-coupling copula".

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