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Title: Portfolio optimization in a multidimensional structural default model with a focus on private equity.

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Portfolio optimization in a multidimensional structural default model with a focus on private equity

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Abstract

For risky investments, like private equity or hedge funds, default risk plays a prominent role. However, the accordant literature on portfolio optimization mostly disregards default risk and accordingly skewed return distribution. This paper presents a framework for a portfolio optimization including default risk. Default is modeled by means of a Merton- and Black-Cox-type structural model. On a portfolio level, the mean and covariance of the resulting return distribution can be derived analytically, allowing a classical mean-variance optimization. Since this optimization ignores tail risk, we additionally present a Monte-Carlo simulation for a mean-*CVaR* optimization. The paper concludes with an application to unlisted private equity and compares its results to a model proposed by Hamada (1972) that does not consider default risk.

Keywords

Portfolio optimization; structural-default model; Black-Cox model; Merton model; private equity; default risk.