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Cost-of-Capital Estimation using Least-Squares Monte Carlo

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Abstract

This thesis evaluates how well LSM (Least-Squares Monte Carlo) succeeds in estimating the cost-of-capital margin derived in Engsner, Lindholm, and Lindskog [1]. Using Gaussian processes to model the cash flows arising from an insurance portfolio, we can explicitly calculate the value of the margin and thus evaluate how well LSM works. While Gaussian assumptions are not entirely realistic in the insurance context we consider, the idea is that LSM might work well also for non-Gaussian assumptions if it works well under Gaussian assumptions.

We consider first an insurance portfolio where the individual risks are independent and identically distributed. It turns out that LSM can estimate the margin very well in this one-cohort setting. The results are less satisfactory in the two-cohort case examined, and more work would be needed to improve the LSM algorithm used. In particular, modeling correlation between different cohorts in a heterogeneous insurance portfolio proved to be complicated

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