

The main objective of this thesis is to build a multi-stage stochastic program within an asset-liability management problem of a leasing company. At the beginning, the business model of such a company is introduced and the stochastic programming formulation is derived. Thereafter, three various risk constraints, namely the chance constraint, the Value-at-Risk constraint and the conditional Value-at-Risk constraint along with the second-order stochastic dominance constraint are applied to the model to control for riskiness of the optimal strategy. Their properties and their effects on the optimal decisions are thoroughly investigated, while various risk limits are considered. In order to obtain solutions of the problems, random elements in the model formulation had to be approximated by scenarios. The Hull – White model calibrated by a newly proposed method based on maximum likelihood estimation has been used to generate scenarios of future interest rates. In the end, the performances of the optimal solutions of the problems for unconsidered and unfavourable crisis scenarios were inspected. The used methodology of such a stress test has not yet been implemented in stochastic programming problems within an asset-liability management.