

Title: Reinsurance optimization using stochastic programming and risk measures

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Abstract: The diploma thesis deals with an application of a stochastic programming in a reinsurance optimization problem in terms of a present regulatory framework of the insurance companies within the European Union, i.e. Solvency II. In this context, the reinsurance does not only transfer a portion of the risk to the reinsurer but also reduces an amount of required capital. The thesis utilizes certain risk measures and their properties, premium principles and non-linear integer programming. In the theoretical part, there are basic terms from Solvency II, reinsurance, risk measures and the comonotonicity of random variables described and the optimization problem itself is derived. The approach is then applied in the practical part on data of Czech Insurers' Bureau using the GAMS software. Finally, a stability of the solution is tested depending on several parameters.

Keywords: reinsurance optimization, stochastic programming, Solvency II, risk measures