

# Optimal reinsurance problems involving risk measures

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This paper studies the optimal reinsurance problem when risk is measured by a general risk measure. Necessary and sufficient optimality conditions are given for a wide family of risk measures, including deviation measures, expectation bounded risk measures and coherent measures of risk. Concrete solutions will be provided for important particular cases.

Besides, since there is no consensus about the risk measure that the insurer must use the paper analyzes the stability of the optimal reinsurance with respect to the risk measure. We will demonstrate that there is a “stable optimal retention” that will show no sensitivity, insofar as it will solve the optimal reinsurance problem for many risk measures, thus providing a very robust reinsurance plan. This stable optimal retention is a stop-loss contract, and it is easy to compute in practice. A fast linear time algorithm will be given, and a numerical example presented.