TITLE: Optimal Risk Retention under Reciprocal Reinsurance with Exponential Utility Functions

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ABSTRACT: One of the interesting problems related to reinsurance is to decide the optimal retention level for the insurers. In this paper, we assume the companies act rationally and they cooperate. The goal is to determine the optimal retention level by maximizing the sum of expected utility functions of the insurance and the reinsurance companies. Under additional assumptions that the insurer and reinsurer both have an exponential utility function, an explicit solution of the retention level can be derived by choosing proper distributions of losses. Two typical reinsurance designs: stop-loss reinsurance and quota-share reinsurance are discussed during this process. We also implement Monte-Carlo simulation to illustrate our results.