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Stochastic Ordering of Reinsurance Structures

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Abstract

The paper offers a simple framework for ranking the common reinsurance structures in practice with the theory of stochastic orders. The basic idea is to slice the space of reinsurance structures into groups by expected loss cost to facilitate the comparisons within the group and between groups. Given the standard risk aversion assumption in economics, a spectrum of reinsurance structures with the same expected loss cost can be compared analytically with one another and sequenced based on their risk coverages under the convex order. The paper then expands the dimension of the comparison to groups of reinsurance structures with different expected loss costs, which can be ranked under the increasing convex order and the usual stochastic order. As such, the paper maps out the ordering for the entire space of reinsurance structures and presents it in a matrix format for quick reference. The implication of this stochastic ordering to reinsurance pricing is also investigated.

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